IN THE CLAIMS:

1. (previously presented) A semiconductor device comprising:

a germanium substrate having a first type of doping;

a nucleation layer of group III-V materials disposed upon said germanium substrate, wherein the deposition of said nucleation layer also forms a germanium junction forming layer on a portion of said germanium substrate, said germanium junction forming layer being actively doped with a constituent element of said nucleation layer, said actively doped germanium junction forming layer having an opposite doping to said first type of doping;

at least one layer of a group III-V semiconductor material adjacent to and disposed upon said nucleation layer;

a first electrical contact formed on said germanium substrate; and

a second electrical contact formed on one of said at least one layer of a group III-V semiconductor material;

a third electrical contact formed on said one or another of said at least one layer, said third electrical contact electrically coupled to said second electrical contact to form a device, said device selected from the group consisting of a transistor, a resistor and a diode; and

a fourth electrical contact formed on said one or another of said at least one layer of said group III-V semiconductor material, said fourth electrical contact electrically coupled to said second electrical contact to form a second device, said second device selected from the group consisting of a transistor, a resistor and a diode.

2. (original) The semiconductor device of claim 1, wherein said constituent element is selected from the group consisting of Phosphorus, Arsenic, and a combination of Phosphorus and Arsenic.

3. (previously presented) The semiconductor device of claim 2, wherein said germanium junction forming layer also being actively doped with a second constituent element from said at least one layer of said group III-V semiconductor material.

4. (original) The semiconductor device of claim 1, wherein said second constituent element is selected from the group consisting of Phosphorus, Arsenic, and a combination of Phosphorus and Arsenic.

5. (cancelled)

6. (original) The semiconductor device of claim 1, wherein the level of said first dopant is a function of a desired frequency operating range and photo-response characteristics of the semiconductor device.

7. (original) The semiconductor device of claim 1, wherein said nucleation layer is lattice-matched to said germanium substrate.

8. (original) The semiconductor device of claim 7, wherein said nucleation layer is an InGaP layer.

9. (cancelled)

10. (cancelled)

11. (cancelled)

12. (cancelled)

13. (cancelled)

14. (cancelled)

15. (cancelled)

16. (cancelled)

17. (cancelled)

18. (cancelled)

19. (cancelled)

20. (cancelled)

21. (cancelled)

22. (cancelled)

23. (cancelled)

24. (cancelled)

25. (cancelled)

26. (cancelled)

27. (original) The semiconductor device of claim 1, further comprising coupling said first electrical contact with said second electrical contact to form an optoelectronic integrated circuit.

28. (cancelled)